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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/637,664	08/11/2003	Makoto Izumi	57810-072	3514

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McDERMOTT, WILL & EMERY
600 13th Street, N.W.
Washington, DC 20005-3096

EXAMINER

BREWSTER, WILLIAM M

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 08/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/637,664	Applicant(s) IZUMI ET AL.	
	Examiner William M. Brewster	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2004.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
 4a) Of the above claim(s) 13-21 is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-12 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>081103</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Claims 13-21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 24 June 2004.

Applicant's election without traverse of claims 1-12 in the reply filed on 24 June 2004 is acknowledged.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atsushi, JP Publication No. 10-229180 in view of DiLoreto et al., U.S. Patent No. 6,076,933.

Atsushi teaches a solid state image device comprising: in fig. 2, an optical lens 24; a solid state image sensor 16, 17 including a microlens 22; and a layer 19 (a light filter) formed between said optical lens and said microlens of said solid state image sensor, p. 4, ¶ 22;

limitations from claim 2: in fig. 2, wherein said optical lens and said microlens of said solid state image sensor are integrally formed through said layer, p. 4, ¶ 22; limitations from claims 4, 5, 6: wherein said microlens of said solid state image sensor includes: a first film having an upwardly projecting shape, and a second film, formed on said first film, having an upwardly projecting shape reflecting said upwardly projecting shape of said first film; wherein said first film and said second film are made of materials having the same refractive index; wherein said first film and said second film are formed by SiN films (film 22 formed from the original layer 21 SiN), p. 4, ¶ 22; in fig. 2, wherein examiner interprets 22 as having two layers of the same refractive index wherein the boundary is not shown between them;

limitations from claim 3: with said microlens of said solid state image sensor has a refractive index of 2.0;

limitations from claims 7-8, in fig. 2, wherein said first film is formed with a plurality of said upwardly projecting shapes at prescribed intervals, peaks of 22, and said second film 18 is formed with a plurality of said upwardly projecting shapes to fill up gaps of said first film; wherein each adjacent pair of said upwardly projecting shapes of said second film are connected with each other to include no substantially flat region on the boundary therebetween.

Atsushi does not specify whether the layer between the optical lens and the microlens contains resin, but rather specifies it is an image filter. DiLoreto teaches an

image filter with resin. DiLoreto teaches in figs. 4-6, an image filter with resin 62, col. 7, lines 17-27, wherein image filter contains a refractive index of approximately 1.5, col. 7, line 56-col. 8, line 12. DiLoreto gives motivation in col. 2, lines 28-45. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining DiLoreto's process with Atsushi's invention would have been beneficial because it provides improved optical properties.

For claim 9, Atsushi does not specify the thickness of the second film, but the practitioner may optimize this dimension.

"Normally, it is to be expected that a change in temperature, or in concentration, or in both, would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art . . . such ranges are termed 'critical ranges' and the applicant has the burden of proving such criticality . . . More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."

In re Aller 105 USPQ 233, 255 (CCPA 1955). See also In re Waite 77 USPQ 586 (CCPA 1948); In re Scherl 70 USPQ 204 (CCPA 1946); In re Irmischer 66 USPQ 314 (CCPA 1945); In re Norman 66 USPQ 308 (CCPA 1945); In re Swenson 56 USPQ 372 (CCPA 1942); In re Sola 25 USPQ 433 (CCPA 1935); In re Dreyfus 24 USPQ 52 (CCPA 1934).

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising there from. Where

patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atsushi in view of DiLoreto as applied to claims 1-9 above, and further in view of Needham.

Needham teaches the solid state image device according to claim 1, fig. 6, further comprising a recessed third film 18 formed on said solid state image sensor, wherein said microlens of said solid state image sensor includes a fourth film 20, embedded in the recessed portion of said third film, SiO₂, exhibiting a larger refractive index than said third film and having a downwardly projecting shape; wherein said fourth film is formed by an SiN film. Needham gives motivation in the Abstract. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Atsushi's and DiLoreto's process with Needham's invention would have been beneficial because it improves the quantum efficiency.

Claims 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atsushi in view of DiLoreto and Needham as applied to claims 1-11 above, and further in view of Wolf, V. II, p. 229-232.

Atsushi, DiLoreto, and Needham do not specify the use of SOG. Needham does specify the use oxide for the third layer, but does not specify SOG. Wolf specifies using

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SOG for an oxide layer and gives motivation in p. 229, bottom ¶. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Wolf's process with Atsushi, DiLoreto, and Needham's invention would have been beneficial because it has simpler processing and lower defect density.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William M. Brewster whose telephone number is 571-272-1854. The examiner can normally be reached on Full Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in cursive script that reads "William M. Brewster".

3 August 2004
WB